



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2

290 BROADWAY

NEW YORK, NY 10007-1866

August 29, 2014

BY ELECTRONIC MAIL

Robert Law, PhD
demaximis, inc.
186 Center Street, Suite 290
Clinton, NJ 08809

**Re: Draft Lower Passaic River Study Area Remedial Investigation/Feasibility Study –
Interim Conceptual Site Model**

Dear Dr. Law:

The U.S. Environmental Protection Agency (EPA) is hereby providing comments on the Cooperating Parties Group (CPG) Preliminary Draft Lower Passaic River Study Area (LPRSA) Remedial Investigation/Feasibility Study (RI/FS) Interim Conceptual Site Model (CSM) submitted on December 20, 2013. Please see the enclosure for comments on the CSM.

Please revise the CSM to address the enclosed comments and provide EPA with a response to all comments no later than forty five (45) days from the date of this letter. If the CPG would like to discuss the conceptual differences identified in the enclosed comments, EPA asks that such a meeting be scheduled as soon as possible so as not to delay submittal of the revision.

I can be reached at (212) 637-4328 if you have any questions or if you would like to schedule a meeting.

Sincerely,

A handwritten signature in black ink, which appears to read "Jennifer LaPoma".

Jennifer LaPoma
Remedial Project Manager
U.S. Environmental Protection Agency – Region 2

Cc: Willard Potter, de maximis
Ray Basso, EPA
Sarah Flanagan, EPA
Patricia Hick, EPA

Comment No.	Document Section/Page	Comment
1	General	Overall, this document lacks context since typically several sections of this report would be included in the Remedial Investigation/Feasibility Study (RI/FS) report. This document appears to duplicate information that will be included in the final RI/FS. In addition, the Site History section of this report duplicates information provided in the Workplan for the Feasibility Study recently submitted to EPA for review and comment. It is recommended that this report provide a clear link to the RI/FS document that is being developed and present the information in a manner that is consistent with RI/FS guidance.
2	General	Emphasis is placed on 2,3,7,8-TCDD throughout the document as the primary contaminant of concern. It is premature to make conclusions regarding the primary contaminants of concern until such time as the RI/FS, including the risk assessments, is completed and approved by EPA. A preliminary review of the fish and crab data indicates that PCBs and mercury are also contributors to the total cancer risk and noncancer health hazards. It is recommended that the document be revised to include a more balanced presentation. Additionally, it should be revised to more clearly explain the various contributors to human health and ecological risks (i.e., PCBs, mercury, DDT, and other contaminants).
4	General	It is not appropriate to focus exclusively on the history of 80-120 Lister Ave without mention of what the other PRPs that make up the CPG have put into the river. The document should be revised to include discussion of the other PRPs. Additionally, a map showing all of the CPG companies and what they have discharged into the river should be included.
5	General	Subsurface sediment characteristics need to be presented and evaluated in the same manner as the surface layer of COCs in discussions of contaminant distribution, risk characterization, and remedial considerations.
6	General	Both the surface and subsurface contamination should be evaluated with respect to extreme weather events and likely future use scenarios. The USACE should be consulted with respect to the reasonable range of future navigational uses throughout the study area.
7	General	Assessment and presentation of COC sediment concentration data with respect to total dry weight needs to be made in addition to the organic carbon-normalized data assessment. In particular, graphs based on total dry weight COC concentrations should be presented in Section 3.2, and the analysis presented in Section 3.3.1 should be repeated based on total dry weight.

Comment No.	Document Section/Page	Comment
8	General	The CSM should include a more detailed discussion of the relationship between contaminant sources, transport pathways, and the distribution of contamination, supported with site-specific data. Although some data are presented to show sediment transport properties (e.g., Figures 3-3 a through j and Figures 3-8 a through c), detailed plan view maps that depict the distribution of contamination in sediment and surface water and the relationship of contaminants to known or suspected industrial sources of contamination, CSO and SWO outfalls, tributaries, and other features that may affect contaminant distribution (e.g., navigation channels) should be presented.
9	General	The CSM should include a summary of other potential contaminant sources within the Lower Passaic River watershed. These include sources that are adjacent to the LPR as well as those connected to the river via CSOs or SWOs. Existing data collected from CSOs, SWOs, and sediment traps should be incorporated into this analysis.
10	General	Future riparian land owner uses (e.g., docks and dredging) must be considered as part of overall sediment management and risk scenarios.
11	General	A comparison should be made between individual dioxins, furans, and PCB congeners, as this may differentiate sources and inform fate and transport mechanisms.
12	General	The scale of the potential sediment management areas should be identified. An assessment of the data density in the identified reaches versus the size of potential sediment remedial areas should be made. Implications with respect to the adequacy of the data for the FS and the potential need for additional samples for remedial design should be qualitatively discussed.
13	General	The CSM and forthcoming draft RI/FS should consider and discuss the contaminant distributions of the families of dioxins/furans and PCBs, not just 2,3,7,8-TCDD.
14	General	The River Mile (RM) system of location identification should be clearly described early in the document. Most importantly, describe where RM 0 and RM 17.4 are located before mentioning other specific locations.
15	Section 1, Page 1, Paragraph 1	First paragraph: The text states “The considered data include: 1) physical, chemical, and radiochemical measurements on sediment samples; 2) bathymetric surveys; 3) physical and chemical water column monitoring (CWCM); and 4) benthic and fish tissue analysis”. Benthic analysis is not adequately descriptive or accurate. It would appear better to state that numerous types of biological data were used to generate the CSM, including biological surveys and chemical analyses of biological tissues, including those of benthic invertebrates and fish.

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16	Section 1, Page 1, Paragraph 2	The statement that “elevated levels of 2,3,7,8-TCDD in sediments (see Appendix B for additional details)...is atypical of other urban river sites” is unsupported and should be deleted, since there are no "typical" urban river contaminant concentrations. Furthermore, Appendix B does not present information that supports this statement. The same statement is made at the top of page 6 and should also be deleted.
17	Section 1, Page 2, Paragraph 3	EPA does not agree with the statement that "a remedy that addresses components beyond the LPR (e.g., sediments from Newark Bay or in urban runoff) is required to prevent re-contamination and maintain long-term risk reduction goals to achieve a sustainable solution for the system" as it is potentially misleading in regards to the remedial action objectives of a preferred remedy. It is not appropriate in a CSM to set a requirement for an appropriate remedy. Please omit this language. Additionally, the term "sustainable" is not defined nor is it clearly applicable in the CERCLA context. Please revise accordingly.
18	Section 2, Page 3, Summary Box	The summary box emphasizes the non-chemical stressors. While it is not inappropriate to discuss them to some extent for context, they should not be the focus of this discussion.
19	Section 2, Page 3, Summary Box	The fifth bullet states that “urbanization has severely degraded habitats, which adversely impacts the benthic community”. Urbanization adversely affects other receptor groups as well, including fish and ecological receptors dependent upon functional riparian zones. Limiting impacts to the benthic community is too narrowly focused.
20	Section 2, Page 3, Summary Box	The sixth bullet states that “loss of habitat and continuous urban runoff have introduced non-chemical stressors to the ecosystem”. Loss of habitat <u>is</u> a non-chemical stressor, and urban runoff contributes <u>chemical</u> stressors to the ecosystem. Please revise the text.
21	Section 2.1, Page 4, Paragraph 4	The last paragraph refers to RM 17.4 to RM 10 being largely non-depositional with coarse-grained sediments and small pockets of silt/fine-grained sediments. Several areas along this stretch of river contain mudflats. Please revise this section to acknowledge the occurrence of mudflats within this section of the river.
22	Section 2.2, Page 6, Paragraph 2	Please eliminate the numbering of the Diamond Alkali OUs, since the numbering system has changed over time and is likely to be confusing to the reader. Please just state that the LPR is an OU of the Diamond Alkali Superfund Site, and that 80-120 Lister Ave and Newark Bay are other OUs.
23	Section 2.2, Page 6, Paragraph 2	Please delete the phrase "also referred to as the Lister Avenue Site" as the Diamond Alkali Site is <u>not</u> also referred to as the Lister Avenue Site.
24	Section 2.2, Page 6, Paragraph 2	The last sentence of the first full paragraph incorrectly states that Occidental entered into the removal action AOC in 2012. The correct date is 2008. Please revise the text.

Comment No.	Document Section/Page	Comment
25	Section 2.2, Page 6, Paragraph 2	While the Lister Avenue site is a preponderant contributor of 2,3,7,8-TCDD to the Lower Passaic River, other sites such as Montrose and possibly Givaudan shouldn't be ignored. Please revise this section to include other sites contributing contaminants to the Lower Passaic River.
26	Section 2.2, Page 6, Paragraph 3	In the last paragraph, the text states that "The LPR remains non-compliant" for many contaminants. The document should provide a list of these contaminants and their concentrations relative to state and federal water quality criteria and describe any programmatic efforts to reduce loadings to the LPR (e.g., TMDL development and implementation).
27	Section 2.2, Page 7, Paragraph 1	Revise text to clarify that non-chemical discharges (pathogens and nutrients) are not the subject of the study.
28	Section 2.2, Page 7, Paragraph 1	The document emphasizes (see page 7) risks from exposure to pathogens. Several statements indicate that pathogen risks are significant without identifying the benchmarks that were used in the analysis to make this conclusion. Please revise or omit.
29	Section 2.2, Page 8, Paragraph 3	The land use description indicates that areas of the Lower Passaic River such as bulkheads and NJ Route 21 are not accessible and not used for catching fish or crabs. As previously indicated in EPA's 1/31/14 comments on the RARC, Route 21 does not eliminate access and anglers have been observed accessing the river. NJDEP has observed individuals fishing and accessing the river at Route 21 and the potential exists for individuals such as workers to fish or crab from bulkhead locations where they work. NJDEP's observations should be included in the text to more fully describe access to the river. Also, the text indicating that individuals are not fishing in the lower 7 miles based on access should be modified to indicate the potential for workers to fish and/or crab at the facilities where they work. Information provided by NJDEP and the master plans should be included in this section consistent with the land use guidance.
30	Section 2.2., Page 8, Paragraph 4	Suggest changing "increased amounts of tolerant species, decreased amounts of sensitive species" to "increased numbers of tolerant species, decreased numbers of sensitive species".
31	Section 3, General	The CSM should consider the sources and spatial distribution of all COCs posing risk within the site.
32	Section 3, Page 9, Summary Box	The first bullet and the text should acknowledge that it is unclear at this stage whether the former Diamond Alkali facility is the only source of 2,3,7,8-TCDD in the freshwater section of the LPR (upstream of RM10). Data presented in Table 5.4 suggest that movement upstream of RM10.2 occurs infrequently, which would limit upstream transport of sediment contamination.

Comment No.	Document Section/Page	Comment
33	Section 3.2, Page 9, Paragraph 2	The CSM discusses the use of OC normalization. The CSM should note that while contaminant concentrations tend to be associated with higher OC content, higher OC content is typically associated with fine-grained sediments and lower-energy reaches of the LPR. As a result, the relationship between OC content and contaminant concentration may be a function of sediment deposition processes in addition to sorption processes. It should be noted that a similar OC/contaminant concentration pattern is observed for copper – a chemical that would not be expected to sorb preferentially to organic material present in sediments.
34	Section 3.2, Page 9, Paragraph 2	While it may be useful to present OC normalized concentrations to help evaluate contaminant transport and partitioning, non-OC normalized concentrations must also be presented to understand the distribution of contamination within the sediment bed. The reliance solely on OC normalized results may obscure patterns of contaminant concentration. Please include discussion and presentation of non-OC normalized data along with OC normalized data within the report.
35	Section 3.2, Page 10, Paragraph 1 & Footnote 2	Pre-2000 data should at least be summarized and compared to the post-2000 data.
36	Section 3.2.1.1, Page 10, Paragraph 2	This section presents an assessment of river contamination via spatial “2-mile bins”. Although this approach has merit as one line of broad assessment (systematic approach, using distance as an arbitrary bin boundary), a finer assessment is recommended with regard to the geomorphic features within each “bin”. For example, due to the variation in sediment bed elevation and surface sediment texture, data should be grouped and evaluated per the following key sub-categories: central channel, side slopes (if this can be discerned; otherwise, group with central channel), erosional shoal areas, and depositional/mudflat shoals (both east and west bank locations). Evaluation of these sub-categories among all “bins” is important to understand potential similarities or differences in these geomorphically-distinct areas throughout the river.
37	Section 3.2.1.1, Page 10, Paragraph 2	Figures 3-3a-j: All of the data points should be plotted, because the way the bins were chosen may obscure the trends in the data, particularly in areas of rapid change in concentrations (which may affect the conclusions of the section).
38	Section 3.2.1.1, Page 10, Paragraph 3	This paragraph states that surficial concentrations of 2,3,7,8-TCDD "tend to be highest in the RM 10 to RM 12 region". Please revise this sentence to clarify whether 2,3,7,8-TCDD concentrations <u>are</u> or <u>are not</u> highest in this region.

Comment No.	Document Section/Page	Comment
39	Section 3.2.1.1, Page 11, Paragraph 1	The conclusions drawn here are based on mean concentrations. Please explain why use of means is justifiable as opposed to median concentrations.
40	Section 3.2.1.1, Page 11, Paragraph 3	This paragraph notes the variation in large-scale longitudinal concentration patterns. This underscores the need to analyze COCs individually on spatial, total, OC-normalized, and temporal bases.
41	Section 3.2.1.1, Page 11, Paragraph 3	There is not much difference between 2,3,7,8-TCDD and Total PCB plots (Figures 3-3a & b). Both show no gradient with river mile and orders of magnitude decreases going upstream from RM12 to above Dundee Dam. Thus, since the conclusion is that 2,3,7,8-TCDD is dominated by internal LPR source(s), the conclusion should also be the Total PCBs are dominated by an internal LPR source. This may apply to some of the metals as well, although it is difficult to see due to the choice of data bins (see previous comment). EPA does not agree that the muted PCB pattern suggests a downstream source given the levels of contamination observed at RM10.9, in particular.
42	Section 3.2.1.2, Page 13, General	The discussion fails to recognize the different potential mobilities and fate and transport characteristics of the COCs. It would be useful to present the cesium-137 graphs (Figure 3-6a) alongside the COC graphs (Figures 3-6b-g as a panel of graphs by core.
43	Section 3.2.1.2, Page 13, Bullets	The vertical axis in Figures 3-6b-g plots depth, not time. The time-dependent conclusions in the bulleted list do not appear to be supported by the figures. Additional clarification/explanation is required in both the figures and the bullet.
44	Section 3.2.2, Page 14, General	This section needs to be amended to include: a. Discussion of (and present on figures) contaminant concentrations in relation to Federal and State Surface Water Standards. b. Information on either the success of CWCM program in attaining standards and/or analytical detection limits below applicable standards, or problems related to same (or both). c. Discussion of the dissolved phase data collected.
45	Section 3.2.2, Page 14, Paragraph 1	In the third sentence, please spell out the names of the three tributaries (Saddle River, Third River, and Second River) instead of collectively referring to them as “several”, as these were the only tributaries sampled during the CWCM.
46	Section 3.2.2, Page 14, Paragraph 2	Figures 3-8a through c look very different when every data point is plotted. When every data point is plotted, there is no difference between surface sediment and water column concentrations.

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47	Section 3.2.2, Page 14, Paragraph 2	Please add one more bullet describing the relationship between concentrations of major contaminants in total vs. dissolved surface water samples, since the latter is generally considered the most bioavailable and potentially most toxic form of most contaminants.
48	Section 3.2.2, Page 14, Footnote 4	Footnote 4 makes a statement that is not supported by the figures. Please review and revise accordingly.
49	Section 3.2.3, Page 15	Figure 3-9 series are very useful. A similar series should be presented for crab hepatopancreas tissue data, as this is a better indicator of crab contaminant burden and potential contaminant transport/impact to crab and upper trophic levels.
50	Section 3.2.3, Page 15	Please clarify if the top six inches were considered as surface sediment in this determination. If so, please revise text for clarity.
51	Section 3.2.3, Page 15	American eel were caught above Dundee Dam and analyzed; however, these data are not depicted on Figures 3-9a to 3-9c. Background levels of selected chemicals detected in sediment and surface water are depicted on Figures 3-3 and 3-8. For consistency, eel data should be presented on Figures 3-9a through 3-9c along with background sediment data.
52	Section 3.2.3, Page 15	Surface water needs to be added to this discussion and to the associated figures (Figures 3-9a-c). Depicting contaminant concentrations in surface sediment, surface water (dissolved and total), and tissue on the same figure, by location, would be useful.
53	Section 3.2.3, Page 15	Biota/sediment accumulation factors should be calculated on an OC/lipid normalized basis and presented for information. The data should be paired on a spatial average and on a spatially consistent basis.
54	Section 3.2.3, Page 15	The exception highlighted for mercury concentrations in blue crab in the next to last sentence seems also to be true at RM9 and RM16, and for 2,3,7,8-TCDD in eel and blue crab at RM1-3. In addition, results downstream of RM0 to RM2 are not shown on Figure 3-9c. Please revise the text accordingly.
55	Section 3.3, Page 16, Paragraph 2	The use of the data presented on Figures 3-10a-b is unclear. Please identify the “external sources” mentioned in the first sentence. In addition, while 2,3,7,8-TCDD concentrations show the most variation between the LPR and external sources, there are also differences in the plots for PCBs, chlordane, and mercury. The CSM needs to identify the relevance in the variations of all contaminants and not focus solely on 2,3,7,8-TCDD.
56	Section 3.3, Page 16, Paragraph 2	Strong correlations are observed between 2,3,7,8-TCDD, DDT, and PCBs. The correlations do not appear to be as strong for other chemicals. The correlation plots would benefit from the inclusion of R-squared values. Regardless of the strength of the correlations, the CSM should describe the physical basis for the correlation (e.g., if contaminants have a similar release mechanism or similar physical and chemical properties).

Comment No.	Document Section/Page	Comment
57	Section 3.3.1, Page 17, Paragraph 1	The statement that “little long-term benefit could be expected from remediation unless upstream sources are controlled” is not supported. This would depend on the extent of recontamination.
58	Section 3.3.1, Page 17, Paragraph 2	The statement that “all other contaminants show more comparable Lower LPR and UPR/Upper Newark Bay concentrations, indicating a higher recontamination potential” is too broad. Whether recontamination occurs requires a more detailed and specific analysis. Footnote 9 supports the need for a more detailed understanding of the system to support the conclusions drawn in this section. Please revise this section to capture uncertainties with the assumptions/conclusions presented.
59	Section 3.3.2, Page 18, Paragraph 1	a. Figure 3-12 – Related to comment regarding footnote 9, a footnote should be added on this figure to explain the apparently errant 2,3,7,8-TCDD data for the Saddle River. If a true source of this contaminant is suspected from the Saddle River, this requires further investigation. b. Relative to the brief discussion at the top of page 18 on the potential influence of CSOs on Passaic River contamination (citing Huntley et al, 1997 and Shear et al, 1996), the CPG should integrate more recent information from the Focused Feasibility Study of the lower 8-Mile study area. Through that study, the tributaries, CSOs and SWOs were not found to be an important source for key contaminants of concern in Passaic River sediment. This information should be incorporated in this section.
60	Section 3.4, Page 18	Although “other stressors” play a role in the overall health of river ecology, the purpose of Section 3.4 relative to remedial decision-making under CERCLA is unclear. Statements relating causation between “other stressors” and Passaic River ecological impairments (benthic community structure) should be modified or removed, unless substantiated by studies which indicate these links are in fact valid for this system. The observed impairments may be caused by, or in combination with other factors, such as chemical exposure.
61	Section 3.4, Page 18-21	There seems to be an over emphasis on other stressors unrelated to releases of hazardous substances. While these may limit the ecological function of the LPR, the presence of these stressors does not obviate the need for actions to reduce risks posed by releases of hazardous substances. Further, even though carp is a non-native fish, it still may be consumed by humans and wildlife and thus may need to be addressed in the baseline human health and ecological risk assessments and be a focus of remedial actions if necessary.
62	Section 3.4, Page 19, Footnote 10	Footnote 10 seems to contradict the point being made in the main text. The main text seems to say that TOC in the LPR is so high above 3.5% that it may result in significantly decreased benthic diversity, but the footnote seems to say that mean TOC in the LPR is less than 3.5%. Please review and revise the text as needed.

Comment No.	Document Section/Page	Comment
63	Section 3.4, Page 20-21	It might be useful to add a statement to this section that common carp are considered highly tolerant of adverse conditions (e.g., turbidity, siltation, nutrient enrichment, chemical contamination, etc.), and their abundance is therefore not unexpected given the multiple stressors identified.
64	Section 3.4, Page 21, Footnote 13	Footnote 13 is unclear – how is the carp abundance biased low or high? And how is it biased spatially? Please review and revise the text.
65	Section 4, Page 22, Summary Box	Sixth bullet – Please clarify in the text what is meant by “urban background”
66	Section 4.1, Pages 22-23	Paragraph that carries over: states that RM 0 to RM 8 is largely characterized by a developed shoreline with structures abutting industrial properties. This seems overly broad. Looking at the CSM figures, there are stretches of vegetated shoreline around RM 2, 3-4, and bits in RM 6-7. RARC (rev. draft 2012) says: “the lower portion of the LPRSA riverbank (from River Mile [RM] 1 to RM 7) is comprised of bulkhead and/or riprap and supports a limited amount of vegetation.” Characterization should be refined/corrected and made consistent with the RARC.
67	Section 4.1, Pages 22-29	This section seems to imply that the impact of non-chemical stressors and chemical stressors (i.e., contaminants) contribute more or less equally to risks to ecological receptors. While the relative contribution to the cumulative (chemical plus non-chemical) risk is likely unknowable, ERAs are most appropriately focused on chemical stressors or contaminants. The potential impacts of non-chemical stressors are usually incorporated into the ERA to help interpret the results and place in context chemical-sourced risk. As currently written, it appears that chemical stressors are not given priority but instead are given equal (or even lower) status than non-chemical stressors such as habitat degradation, nutrient enrichment, etc. Please rewrite this section to properly identify the impact that chemical contaminants have on the LPRSA receptors.
68	Section 4.1, Pages 22-29	In a more specific example, differences in community structure are in this section primarily assigned to differences in physical habitat, substrate, salinity, nutrients, etc., but there is little mention of the potential impact of elevated concentrations of toxic contaminants on community structure. It should be recognized that, for example, elevated concentrations of phosphorus (as noted in the current text) and toxic organic and inorganic contaminants in surface sediment and in surface water can adversely affect the numbers and types of organisms comprising benthic communities.
69	Section 4.1.1, Page 24, Paragraph 1/ Footnote 18	Text specifies that river otter will be used to evaluate LPR mammal populations in the BERA. River otter is also the only mammal listed in Table 4-1. This is inconsistent with the RARC report which specifies that both river otter and mink models will be evaluated in the BERA. Please revise the text and Table 4-1 to include mink.

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70	Section 4.1.3, Page 26, Paragraph 1	The first sentence is confusing and should be corrected. The phrase “.....including those resulting from human activities...” is used in a manner suggesting that contaminants from “other than human activities” are key, which is not true. Since human activities are the primary source of chemical contaminants in this river, simply remove the highlighted phrase.
71	Section 4.1.3, Page 26, Paragraph 1	Please omit the parenthetical "USEPA may approve the CSM."
72	Section 4.1.3, Page 26, Paragraph 1	First paragraph: Please provide a reason why the discussion in subsequent subsections is limited to benthos, fish, and birds as other ecological receptors are being evaluated in the BERA.
73	Section 4.1.3.1, Page 27, Paragraph 1	Top of page: Is there any reason(s) that can be identified as to why communities in lower 9 miles are “recently disturbed”? How does heavy organic loading come into the discussion? Also, The next paragraph, appears to conflict, stating that communities are mature above RM 6.5 (below RM 9 cited as disturbed earlier), but “perturbed” below 6.5, especially between RM 2 and RM 5. Also, communities are highly disturbed or stratified at RM 1 on page 26 and mature on page 27.
74	Section 4.1.3.1, Page 27, Footnote 21	Footnote 21: Indicates that tolerance to pollution was not included in categorization of taxa, yet the first sentence in 4.1.3.1 characterizes the benthic invertebrates as “pollution-tolerant” species. Please review and clarify/update as necessary.
75	Section 4.1.3.1, Page 28	As stated in previous comments on Section 4.1.3.1 herein, this section contains contradictory information and should be revised for consistency and clarity.
76	Section 4.1.3.3, Page 29, Paragraph 3	Second sentence of first paragraph: “Gulls, ducks, and swallows were dominant along <u>the lower portion of the LPRSA</u> (Ludwig et al. 2010), whereas gulls, ducks, and geese dominated <u>during the summer and fall 2010 surveys</u> (Windward 2012b).” What is the significance of this observation? Also, there is no discussion of mammals other than humans? Please revise and clarify this content.
77	Section 4.2, Page 30, Paragraph 1	<i>Timeframes of Exposure.</i> EPA disagrees with the information presented in Section 4.2 that suggests that all exposures to the river are “hypothetical”. As indicated in the Dispute Resolution, and additional information submitted by NJDEP, individuals are currently fishing and crabbing in the river and using the river for recreational purposes such as swimming. The text needs to clarify that the risks and hazards are evaluated for current and future receptors and not only “hypothetical individuals” as suggested in the text...
78	Section 4.2, Page 30, Paragraph 1	Please revise "hypothetical future conditions..." in the first paragraph to relay that the exposure assumptions reflect anticipated future conditions and that the current exposures are expected to increase in the future based on anticipated conditions.

Comment No.	Document Section/Page	Comment
79	Section 4.2, Page 30, Paragraph 2	Second paragraph: The paragraph should note the presence of several residential properties on the eastern bank with yards that abut the river, perhaps at the end of the sentence that mentions parks and boathouses above RM 7.
80	Section 4, Page 30, Paragraph 2	Text in the second paragraph is not consistent with the RARC (April 2012 - draft) and should be revised. For example, this document portrays RM 8 and above as primarily commercial and recreational, whereas the aforementioned RARC describes it as increasingly residential and recreational. Please review this information across these three documents and revise for accuracy and consistency.
81	Section 4, Page 30, Paragraph 2	The discussion regarding future waterfront planning revitalizing parks and increasing open space, "the resulting change to shoreline access is unclear" is inaccurate. Waterfront revitalization is likely to increase recreational use. This is supported by Figures 4-12, where it appears that there is accessible mudflat.
82	Section 4.2, Pages 30-33	Recreational Use of the River: The discussion of uses of the River also needs to acknowledge that adolescents have been observed swimming in the River (youtube video). The text needs to accurately reflect the number of days an individual may be exposed during various recreational uses of the river based on age categories, consistent with the RARC and the results of the Dispute Resolution.
83	Section 4.2, Pages 30-33	<i>Recreational Use of the River.</i> The information presented in this section of the report regarding recreational use of the River are not consistent with the conclusions in the RARC, as per the Dispute Resolution.
84	Section 4.2, Pages 30-33	Section 4 of the report provides information on risk receptors and exposure pathways indicating that work on the development of the risk assessments for human health and ecological risk are currently ongoing. Based on the current status of this work, it appears to be premature to make conclusions on a document that has not been completed or reviewed by EPA and the Partner Agencies.
85	Section 4.2, Pages 30-33	The text needs to provide the site-specific fish and crab consumption rates identified in the Dispute Resolution. The current presentation of information does not reflect the range of published surveys in the LPR-Newark Bay complex that show anglers eating their catch, sharing their catch with their families and eating crabs. Those surveys should also be discussed here to provide a more balanced view. The current presentation is inconsistent with the goals of identifying risks/hazards to the RME individual.

Comment No.	Document Section/Page	Comment
86	Section 4.2, Pages 30-33	The document should also include recent information provided by NJDEP regarding specific segments of the population that report consumption of carp. In addition, NJDEP has provided information regarding fishing and crabbing by homeless individuals and this site specific information should also be provided in the text. Based on the limited information presented on the CPG's Creel Angler Survey it is difficult to compare the results from that survey with the results from other site-specific surveys outlined in the Dispute Resolution.
87	Section 4.2, Pages 30-33	<i>Reasonable Maximum Exposure.</i> The current text does not indicate that the risk assessment will be developed to evaluate risks and hazards to the Reasonable Maximally Exposed individual consistent with Risk Assessment Guidance for Superfund. Several statements seem to suggest a concern for a population exposure rather than an individual exposure. Consistent with EPA guidance, the risk assessment evaluates risks/hazards to the RME individual and not a population. The text needs to clarify this point.
88	Section 4.2, Pages 30-33	<i>Additional Exposure Observations by NJDEP.</i> NJDEP recently provided additional information regarding consumption patterns of the Polish population and other activities along the River. It is recommended that this information be included in the text.
89	Section 4.2, Page 31, Paragraph 3	To date, the 2011 to 2012 Creel/Angler Survey of the LPRSA has not been submitted to the regulatory agencies. In a letter dated April 14, 2011, Walter Mugdan, Region 2 Director of the Emergency and Remedial Response Division, informed Dr. Robert Law, that the Creel/Angler Survey could not be used in the RI/FS for the 17-miles. No alternate direction has been provided to CPG and therefore, the narrative regarding this survey should be omitted.
90	Section 4.2, Page 31, Paragraph 3	The text states "Fishing has been observed, with most activity above RM9 (predominantly freshwater reach)." The basis for the emphasis on fishing above RM 9 is not clear and should be revised. During the course of this investigation, fishing has been observed in the lower portions of the river too.
91	Section 4.2, Pages 31-32	The NJDEP Fish Code Regulations have specific definitions and recommendations for "catch and release" (http://www.state.nj.us/dep/fgw/news/2013/fishcode_proposal.htm) that have not been identified for the Lower Passaic River. It is recommended that that term "catch and release" be replaced with individuals not consuming the fish or crabs they caught.
92	Section 4.2, Page 32, Paragraph 1	First paragraph: The first sentence should be revised to say "Potential human receptors at the LPRSA include recreational anglers, boaters, waders, swimmers, workers, and residents with properties abutting the river."

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93	Section 4.2, Page 32, Paragraph 1	In the first paragraph, please revise the "may" in the statement regarding anglers who do not catch-and-release to "will." Additionally, exposure to other chemicals beyond dioxins and furans should be accounted for in the statement.
94	Section 4.2, Page 32, Paragraph 2	<i>Summary of Site Risks.</i> The report (see page 32) indicates the primary contributor to the cancer risks and noncancer health hazards is 2,3,7,8-TCDD while PCBs and mercury are potential contributors. It is premature to make these conclusions since the risk assessment has not been completed and provided to EPA and the Partner Agencies for review and comment. The conclusions should reflect risks to the Reasonably Maximally Exposed individual as outlined in the Dispute Resolution.
95	Section 4.2, Page 32, Paragraph 2	In the second paragraph, conclusions based on the CAS, should not be included as it was not approved by EPA. In the last sentence of that paragraph, as the BHHRA is still ongoing it is not appropriate to cite preliminary data evaluation about the human health risks. Additionally, the last sentence appears to minimize the impacts of PCBs and should be revised.
96	Section 4.2, Page 32, Paragraph 3	Pathogens are not addressed in the human health risk assessment under CERCLA so discussion of human risk from microbial exposure is not appropriate. This is a separate issue EPA will need to address through other regulations (e.g. TMDL)
97	Section 4.2, Page 33	Last sentence: Please revise the end of the sentence to read "...tend to limit, but do not prevent, current human exposures to site-related contaminants." It cannot be assumed that some of the site-specific factors mentioned here will exist indefinitely into the future.
98	Section 5, Page 34, Summary Box	3rd bullet - Erosion and deposition over time could have caused peak concentrations to be closer and farther from the water-sediment interface at different points in time in a location with net deposition since the early 1960's, even though the bed is neither stable nor static.
99	Section 5, Page 34, Summary Box	Long-term net transport is downstream (as discussed in Section 5.3.1) – 4th bullet should be corrected. The conditions under which upstream transport may occur should be stated.
100	Section 5, Page 34, Summary Box	The 5th bullet should be supported by a figure. The statement needs to be expanded to more fully discuss the mean and median concentrations of the contaminants.
101	Section 5, Page 34, Summary Box	The 6 th bullet should be expanded to more fully discuss other contaminants (at least PCBs & mercury, like 5 th bullet).

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102	Section 5, Page 34, Summary Box	The 7 th bullet should be supported by a figure and discuss other contaminants.
103	Section 5, Page 34, Summary Box	The last bullet is not supported and should be deleted.
104	Section 5, Page 35, Paragraph 2	The key COCs should be assessed based on their individual risks, areal and depth characterization, and unique fate and transport properties. Synergies in remedial efforts due to similarities in co-location and recovery should be assessed as part of the feasibility study alternative assessment.
105	Section 5.1, Page 36, Paragraph 1	Figure 5-1 and footnotes 25 & 27: A low-pass filter should not be used to assess the upstream extent of solids and contaminant transport associated with estuarine circulation. Solids within the salt wedge can deposit at high slack tide at locations upstream of where low-pass filtered results would indicate the location of the salt front. Footnote 26: Set-up/set-down refers to regional changes in water surface elevations, primarily due to large-scale persistent winds
106	Section 5.1, Page 36, Paragraph 2	Because the assumption in the parenthetical statement "(assuming similar conditions in Newark Bay)" is invalid (i.e. Newark Bay navigational channel depths were clearly different) this paragraph is irrelevant and should be deleted.
107	Section 5.1, Page 37, Paragraph 2	The discussion of Figure 5-2 is inconsistent with the conditions at the time of the data collection. The data were collected under transient conditions of flow and tides, not a persistent flow of 500 cfs. The flow at Dundee Dam on the preceding day average 310 cfs, with a minimum of 253 cfs and the flows for the prior 5 days averaged approximately 280 cfs. Tidal stage data at Bergen Point indicate a rise in the maximum water surface elevation, well outside the typical spring-neap changes. The discussion needs to be modified or data from a different time period need to be described. The data shown on Figure 5-2 do not support the statement that "...the flood period is shorter than the ebb period"
108	Section 5.1, Page 37, Paragraph 2	The last line states "there is little variation or pattern to the TSS fluctuations.", however, the small variations in concentrations do appear to follow a pattern related to velocity. The monitoring location referred to should be 13.5, not 13.6.
109	Section 5.1, Page 37, Paragraph 2	Second paragraph, last sentence: Please clarify the last sentence, "Upstream of the salt wedge....."

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110	Section 5.1, Page 37, Paragraph 3	The text discusses the movement of a “distinct “fluff layer” (or “mobile pool”) of unconsolidated sediments that overlies a less erodible (consolidated) parent bed.” The CSM should provide data supporting this concept (e.g., sediment core logs, near bottom surface water sampling results, etc. In addition, on the following page, the text states: “Fluctuations in water column suspended solids over the course of a tidal cycle suggest a fluff layer thickness of a few millimeters or less.” The basis for this conclusion should be provided.
111	Section 5.1, Page 37, Paragraph 3	Please add acoustic backscatter data to description of PWCM components.
112	Section 5.1, Page 38, end of first full paragraph and Footnote 30	Provide citations for studies referred to in "Studies suggest that the fluff layer contaminant inventory is replenished from the parent bed via slow exchange processes". Also, provide citations for instances where a "diffusive porewater exchange" was used to represent the lumped processes of particle mixing and flux of dissolved or colloidal contaminant.
113	Section 5.2.1, Pages 38-39	The discussion on transport regimes are over simplistic and are in need for more detail. For example, in Regime 3, the text implies that all fine-grained sediments are transported from Dundee Dam to Newark Bay. It is likely that some finer grained materials are deposited throughout the river. Please provide greater detail in the discussion for all three transport regimes.
114	Section 5.2.1, Page 38	The relationship between flow conditions and distance from the entrance to Newark Bay is complex. The discussion of the various flow regimes would benefit from a discussion of the frequency of various flow conditions and the location above which net flux is downstream should be provided. While it is important to understand the direction of net flux during various flow events, the key question is what is the net flux on an annual or even longer term basis
115	Section 5.2.1, Page 38	The discussion of Regime 1, low flow conditions, states that there is a net transport of sediment from Newark Bay upstream into the LPR. It is unclear whether the fluff layer contains elevated levels of site contaminants such as 2,3,7,8-TCDD and whether upstream movement of this fluff layer is an important transport mechanism.
116	Section 5.2.1, Page 39, Paragraph 1	Regarding Regime 2, moderate flow conditions, it seems likely that the fluff material that has moved from Newark Bay into the LPR under low flow conditions would then move right back into Newark Bay under moderate flow conditions.
117	Section 5.2.1, Page 39, Paragraph 1	It is expected that regime 2, moderate river flow would have a component of fine sediment re-settling elsewhere within the river, rather than all being flushed out to Newark Bay, as currently indicated.

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118	Section 5.2.1, Page 39, Paragraph 2	The first paragraph which appears after the numbered paragraph should be revised/clarified for a more straight forward explanation.
119	Section 5.2.1, Page 39, Paragraph 3	The CSM should note that the transport versus flow described by Chant (2010), SEI and HQI (2011), and the Fall PWCM data shown on figure 5-4 all are based on data collected over limited time periods and therefore reflect only the conditions that occurred during the monitoring period. Transport under different flow and tidal conditions (both magnitude and sequencing) could be different.
120	Section 5.2.1, Page 40, Paragraph 1	In the paragraph, which carries over from the previous page, reference is made to post dredging after 1950 in lower 8 river miles, however the last dredging was done in 1983 in RM 0 to 1.9. Please revise statement to account for this.
121	Section 5.2.1, Page 40, First new paragraphs	The first sentence should be rewritten to clarify if the link between Chant's estimate of solids loadings and the volume of deposited sediment is intended to infer a relative contribution of solids from upstream versus Newark Bay.
122	Section 5.2.1, Page 40, Paragraph 2	The 4 th sentence begins by describing middle panel of Fig 5-5, but seems to morph into describing bottom panel? Please clarify.
123	Section 5.2.1, Page 40, Paragraph 2	The second paragraph (particularly last ½) is confusing and needs to be re-written more clearly.
124	Section 5.2.1, Page 40, Paragraph 2	Please clarify the explanation and interpretation of Figure 5-5 in the second paragraph.
125	Section 5.2.2, Page 41, Paragraph 3	In the second full paragraph, please revise to account for dredging that occurred as recently as 1983 up to RM 1.9, not RM 1.
126	Section 5.2.2, Page 41, Paragraph 3	Bathymetry survey differences should be used to calculate deposition rates and presented in comparison to the radiochemical profile sedimentation rates.
127	Section 5.2.2, Page 41, Footnote 33	Please explain the relevance of this foot note (33) as it relates to the topic. Future sea level rise is not discussed.

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128	Section 5.2.3, Page 42	This section requires additional detailed information on the high resolution cores selected for the analysis presented, including: the number and identity of the cores selected, RM designation, and the geomorphic location within the river (channel, shoal - inner bend, shoal- outer bend). Early on, since the goal of these cores was to obtain an unbroken record of sedimentation, these cores were purposefully selected in areas expected to be stable. Often, these were collected in the channel. This information is critical for understanding what features of the river are represented by the analysis presented. The conclusions drawn may not apply to regions of the river not represented by the data used for this analysis.
129	Section 5.2.3.1, Pages 42-43	The cores showing the Cs-137 profiles are not presented, so none of the statements in the first paragraph are supported. The selection of data used in the second paragraph is also unsupported. This whole section needs to be supported by figures and expanded into a more robust discussion of all of the data.
130	Section 5.2.3.1, Page 43, Paragraph 1	It is stated that at locations where peak Cs-137 is found at the surface, the low energy environment at these locations “precludes erosion” as the reason for this condition. This may be the case during normal flow and routine tidal cycles, however, during significant storm events, erosional forces may be greater everywhere in the river, including these locations. Erosion, along with low deposition in these areas, may contribute to the observation of peak Cs-137 and associated contaminant concentrations in surface/near surface sediment.
131	Section 5.2.3.2, Page 43, Paragraph 2	Similar to the comment above, the assessment presented requires clarification concerning which cores (and their locations in the river) were used for the conclusions drawn, as different “features” of the river are expected to behave differently due to different hydrodynamic conditions at those locations. The current discussion seems to be limited to channel areas. Elsewhere in the river (i.e., outside of RM 0-1, which was provided as an example in this section) cores without distinct correlation between Cs-137 and contaminant peaks may also represent disturbed sediment bed from storm event impacts as well as actions due to dredging, in- river or near-river construction, and other disturbances.
132	Section 5.2.3.2, Page 43, Paragraph 2	The highest levels of contaminants can be compared with the Cs-137 peak, but are not co-located, insofar as they all have different peaks (e.g., PCBs peak is not co-located with dioxins). Is it correct to state that cores without distinct Cs-137 peaks can be stable?
133	Section 5.2.3.2, Page 43, Paragraph 2	Co-located current peak contaminant and cesium could be found in an area subject to erosion and deposition with net deposition allowing a peak to remain - not necessarily the 1963 peak

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134	Section 5.2.3.3, Page 44, Paragraph 1	Greater description (including locations, depicted on map and with representative cores) is needed, of the areas discussed in bullets 2 and 5 (page 44) for identifying the erosional areas highlighted.
135	Section 5.2.3.3, Page 44, Paragraph 1: Bullets 3 and 4	Discussion should acknowledge that only net changes are identifiable in bathymetric comparisons; perturbations about an equilibrium may not be detected. The phrase "no change" should be qualified with the assumption used for a quantifiable change. The statement that there was "no change in elevation in the mud flat areas and at the edges of the river at the extent of the survey." calls into question the assumption stated elsewhere that future infilling will keep up with sea level rise
136	Section 5.2.3.3, Page 45, Paragraph 2	Second paragraph: It appears that Figure 5-12 should be referenced at the end of this paragraph.
137	Section 5.2.3.3, Page 45, Paragraph 2	The discussion of differences in river flow conditions in the 1949 to 1995 and 1996 to 2011 would benefit from a comparison of the cumulative frequency distributions of flow for the two periods, which would show that the differences are not as drastic as suggested by the exceedances of single value 13,000 cfs.
138	Section 5.2.3.3, Page 45, Paragraph 3	The depth difference maps do not show "widespread infilling" as mentioned in the second to last sentence.
139	Section 5.2.3.3, Page 45, Paragraph 3	Third paragraph: More explanation should be provided for the last sentence, "The infilling pattern suggests....."
140	Section 5.2.3.3, Page 46, Paragraph 1	The Figure 5-13 series is presented on a scale that is too coarse to show any meaningful change, thus leading to the conclusion that there has been no erosion or deposition over time. CPG needs to either justify use of this coarse scale, or plot on a +/- 3-inch scale to see if that makes any difference to their conclusions.
141	Section 5.2.3.3, Page 46, Paragraph 1	First sentence: "(erosion is observed following a low flow period and deposition following a high flow event, see Figures 5-13a through 5-13f)." This sentence is confusing. Is erosion being observed during high flow and deposition is observed during low flow? Please revise text.
142	Section 5.3, Page 46, Paragraph 2	The text states that "The Diamond Alkali pesticide manufacturing facility at 80 and 120 Lister Avenue, in Newark, NJ, is widely documented as the predominant source of the 2,3,7,8-TCDD in the LPRSA". The CSM should consider the potential for other industrial facilities within the Lower Passaic River watershed.

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143	Section 5.3, Page 46, Footnote 37	Foot Note 37: The application of the Thiessen polygon approach used to estimate contaminant concentrations (mass) has not been agreed to by the USEPA. Please indicate this fact in the text of this foot note and on page 57 second paragraph. Questions on the interpolations used by the CPG have been previously raised please refer to: Ray Basso's April 1, 2014 letter to the CPG that re-state the technical concerns with their bed mapping, which were discussed with the CPG modeling team in a September 26, 2013 meeting. EPA and CPG should further discuss interpolation method after receipt of the CPG's modeling submissions outlined in the CPG's 7/18/14 letter to EPA.
144	Section 5.3.1, Pages 46-50	The discussion is limited to 2,3,7,8-TCDD. The text needs to be revised to include other contaminants.
145	Section 5.3.1, Pages 47-48	Discussion of mass distribution would be improved with consideration of mass per unit area.
146	Section 5.3.1, Pages 48-49	Discussion of salinity intrusion frequency (bottom of pg. 48 to top of pg. 49) needs to consider effect of more limited salt intrusion in Newark Bay when navigation channel was shallower.
147	Section 5.3.1, Page 49, Paragraph 1	First paragraph: Text states "consistent with expected high flow shear stress trends moving downstream." Please clarify for the reader what is trying to be conveyed here: "Is the intent to say that under high flow conditions, shear stresses are higher upstream and decrease moving downstream as the river widens and becomes deeper"
148	Section 5.3.2, Pages 50-55	The discussion is limited to 2,3,7,8-TCDD. The text needs to be revised to include other contaminants.
149	Section 5.3.2.1, Pages 51-53	The CWCM program included sampling at surface and bottom, during flood, ebb, high slack, and low slack tidal conditions. Figures 5-18 5-19 and discussion in section 5.3.2.1 do not adequately interpret these data. Significant insight was discussed in the sediment transport section by evaluating differences along the river during flooding and ebbing tides and different flow conditions. The interpretation of the CWCM data needs to be expanded beyond a two summary figures.
150	Section 5.3.2.1, Pages 51-53	This section discusses water column concentrations of contaminants, but it should be noted here or in later sections that even relatively low concentrations of some contaminants in the dissolved phase can be bioaccumulated to unacceptable levels. The finding that some contaminants are found primarily in the solid phase within the water column is not necessarily indicative of low risk.
151	Section 5.3.2.1, Page 51, Paragraph 2	The pattern of surface water contamination presented in Figure 5-18 does not support the statements in the text. With the exception of two sampling points (June 2012 and August 2011 events), sample concentrations are relatively consistent across flow and tidal range as presented in Figure 5-18. There seems to be a spatial pattern as presented in Figure 5-19 with slightly

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		higher suspended sediment contaminant concentrations in the upstream portion of the site.
152	Section 5.3.2.1, Page 52	Figure 5-19 and the conclusion that water column concentrations are lower than surface sediment concentrations – see Comment No. 65 on Figure 3-8 (the way the data are binned seems to influence the conclusions – all data should be plotted without binning).
153	Section 5.3.2.1, Page 53, Paragraph 2	EPA would like to further discuss the fluff layer versus the parent bed. EPA intends that through the course of the BERA review and modeling coordination this will occur and direction will be provided for inclusion in the draft RI.
154	Section 5.3.2.2, Page 54	Evaluation of the effect of high flow events such as Hurricane Irene would be better accomplished through the evaluation of bathymetry surveys that measure sediment bed elevation differences pre and post the high flow event. Based on Figures 5-13 a –f, Hurricane Irene appears to have resulted in isolated areas of erosion within the LPR (particularly in the navigation channel) and an extensive area of sediment deposition just downstream from the mouth of the LPR.
155	Section 5.3.2.2, Page 54	First paragraph, last sentence: The confounding factor of infilling confounding the interpretation of SSP data should be explained more fully. The SSP program was performed 4 to 6 months following Hurricane Irene at the end of August 2011 and a flow of over 6000 cfs occurred in December 2011.
156	Section 5.3.2.2, Pages 53-55	Please revise this section for clarity. The section didn't have a logical transition between the discussions regarding CWCM and SSP2.
157	Section 5.4.1, Page 55	Clarify the layer referred to in the sentence, "Sedimentation, which occurs if deposition exceeds erosion, reduces concentration by burying the higher concentrations present in the layer and particularly near the bottom of the layer."
158	Section 5.4.2, Page 56, Paragraph 2	Item 2: Text states: "Cores with higher calculated sedimentation rates tend to have lower surface concentrations (see Panel b) but not lower peak concentrations (see Figure 5-20, Panel a)." The data presented in Figure 5-20 does not support this statement. The data seem to suggest greater variability in sediment concentrations in areas with lower sediment deposition rate. This may be a function in the spatial variability of the sediment deposition rate.

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159	Section 5.4.2, Page 56, Paragraph 2	item 3: Text states: “Widespread burial of the 2,3,7,8-TCDD peaks has occurred such that surface concentrations are often an order of magnitude or more lower than the peak; however, there are also numerous cases where the peak resides at the surface (see Figure 5-20; Panel d), especially in the RM 10.9 mudflat.” The CSM should discuss why certain areas have surface concentrations greater than subsurface – especially in depositional areas such as the RM 10.9 mudflat. Are these areas being impacted by ongoing sources of sediment contamination?
160	Section 5.4.2, Page 56	Please revise the natural recovery discussion to discuss other key contaminants beyond 2,3,7,9-TCDD.
161	Section 5.4.3, Pages 57-58	The discussion is limited to 2,3,7,8-TCDD. The text needs to be revised to include other contaminants. Also the application of the Thiessen polygon approach used to estimate contaminant concentrations (mass) has not been agreed to by the USEPA. Please indicate this fact in the text
162	Section 5.4.3, Pages 57-58	The categories of erosional/mild depositional/high depositional are arbitrary and will change depending on the bathymetric surveys that are chosen for comparisons. Also, bathymetric surveys can only capture long term erosion or deposition, not day to day or even storm to storm erosion and deposition. A straightforward analysis of the data shows that median concentrations from 1995 through 2012 have not changed for most of the contaminants of concern (dioxins, PCBs, mercury and other metals, pesticides), leading to the conclusion that LPR has not experienced significant natural recovery in the past 17 years. This is consistent with the discussion of the system reaching equilibrium hinted at in Section 5.2.2 (1 st paragraph). At the end of the section, the statements about declining contaminant trends in fish tissue are incorrect – there is no consistent decline in fish tissue contaminant concentrations when normalized by OC. This entire section needs to be re-written.
163	Section 5.4.3, Page 57, Paragraph 1	First paragraph: The CSM estimates rates of natural recovery through a comparison of surface sediment concentrations in circa 1995 and circa 2010. The CSM should include an evaluation of spatial heterogeneity by comparing paired sample points to determine whether observed differences are due to temporal declines in sediment concentrations rather than differences attributable to spatial variability.
164	Section 5.4.4, Pages 58-59	All of these statements are unsupported. The entire section should be rewritten
165	Section 6.1.1, Page 60, Paragraph 1	A correction is needed regarding the degree of risk assessed for ecological receptors.

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166	Section 6.1.1, Page 60, Paragraph 1	First paragraph: The discussion primarily focuses on 2,3,7,8-TCDD, but should also include other COPCs as well. In addition, based on the figures for the cores, it is unclear if the peak loading for other major contaminants can be so easily included with 2,3,7,8 (and in fact that statement is contradicted on page 13). In the second paragraph the statement about targeted remediation is slowly recovering is too specific for a CSM, and suggests a preferred remedial alternative. Please revise this section accordingly.
167	Section 6.1.1, Page 60, Paragraph 2	The summary (page 60) indicates that the LPRSA system is recovering however, the text fails to indicate that fish and crab advisories are still required on the LPRSA and are expected to continue for the foreseeable future since the concentrations of various contaminants in fish and crabs are still above health based levels of concern. It seems premature that a Conceptual Site Model include recommendations and conclusions regarding remedial actions at the site. This information requires further evaluation, as noted throughout these comments and in the RI/FS.
168	Section 6.1.1, Page 61, Paragraph 1	First bullet: It is unclear that the Diamond Alkali facility is the sole source of dioxin contamination at the Lower Passaic River site. Information presented in the CSM does not fully support a hypothesis that upstream transport to RM 14 is occurring.
169	Section 6.1.1, Page 61, Paragraph 1	Second bullet: The CSM has failed to provide sufficient data to support the assertion that all chemicals with the exception of 2,3,7,8-TCDD are present at concentrations similar to regional background levels. The transmittal letter included with the CSM suggests that this information will be provided at a future date. Developing estimates of background surface water and sediment levels upstream of Dundee Dam and the contribution of watershed sources of contamination within the LPR will be critical to the evaluation of remedial action alternatives at the site.
170	Section 6.1.1, Page 61, Paragraph 1	Third bullet: The analysis does not support the conclusion that concentration gradients are muted over the lower 12 miles of the Passaic River. Rather, the use of OC normalized data which tends to reduce the relative concentration in fined grained sediment with high TOC and increase the relative concentration in coarse grained sediments with low TOC has contributed to the conclusion that concentration gradients are muted. Data should be presented on site figures, utilizing an appropriate interpolation procedure to evaluate the spatial distribution of site contaminants and identify source areas. This bullet is unsupported and should be removed.

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171	Section 6.1.1, Page 61, Paragraph 1	Fourth bullet: Site data suggests that contaminant concentrations decline upstream of RM 12. However, evaluation of spatial contaminant distribution patterns suggests that pockets of 2,3,7,8-TCDD contamination in the 250 – 500 ng/kg range are present between RM 12 and 13; pockets of 2,3,7,8-TCDD contamination in the 20 – 100 ng/kg are present between RM 13 and 13.5; pockets of 2,3,7,8-TCDD contamination in the 2 – 20 ng/kg are present between RM 13.5 and RM 14 and that 2,3,7,8-TCDD concentrations upstream of RM 14 are generally less than 2 ng/kg.
172	Section 6.1.1, Page 61, Paragraph 1	Fifth bullet: Although the data suggests that concentrations of contaminants tend to decrease into Newark Bay, this conclusion should be supported with plan view site figures that present the lateral distribution of sediment contamination within the Lower Passaic River Study Area.
173	Section 6.1.1, Page 61, Paragraphs 1 and 2	Second bullet in the first and second sets of bullets: PCB concentrations are higher within LPR, in particular at RM 11, than the UPR and Newark Bay. To a certain extent, total DDx and chlordane have similar conditions (see Fig 3-11). There will be a meaningful reduction in these contaminant concentrations after remediation. The referenced two bullets need to be revised.
174	Section 6.1.1, Page 62, Paragraph 2	First full paragraph: Please further clarify what is meant by "regional background". The second full paragraph discussing non-chemical stressors should be deleted as there is no basis for why they will "need to be addressed" as part of a "sustainable remedy".
175	Section 6.1.2, Page 62, Paragraph 4	Section 6.1.2 should be removed in its entirety from the CSM document. Such a discussion would be more appropriate for the FS.
176	Section 6.1.2, Page 63	Remedy selection and not just the remedial design will consider the risk across all contaminants. The rationale provided for the concept that removing 2,3,7,8-TCDD would be sufficient to address risk is not currently supported. Additionally, please delete reference to "non-chemical stressors such as pathogens" as these are not addressed by a CERCLA remedy.
177	Sections 5.3, 5.4, and 6, Pages 46-63	All key COCs should be discussed and presented in these sections at this level of detail.

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178	Figures	Please revise figures for clearer labeling. In general, it was felt that the legends were not clear enough and it was difficult to review; the small font is hard to read what is referenced on figure. For example, please see Figure 3-8.
179	Figures	Similar to the text, many of the figures focus primarily on concentrations of 2,3,7,8-TCDD. Other chemicals should also be included.
180	Figure 2-3a	This figure should characterize all of Kearny Point within the study area as silt, not just the edge as currently shown; it should be consistent with Figure 4-10.
181	Figure 3-1	Please label this figure as the <u>legend</u> for the whisker plot figures.
182	Figures 3-1 and 3-2	Please explain if the whisker is limited to 50% of the spread (higher or lower). If not, please provide an explanation why it only applies to the higher but not the lower spread.
183	Figure 3-8a	Please explain why the TCDD and PCB concentrations are highest at RM 10.9 than downgradient areas, if the contamination is coming from downgradient
184	Figure 3-8b	Please explain why the HMW and LMW PAH concentration are highest at RM 4.
185	Figure 3-8c	Please explain why mercury is so much higher in the upper Newark Bay.
186	Figure 3-11	The labeling on the Y axis is incorrect. A "1" should be added next to the dash line. Suggest using a semi-log scale plot.
187	Figure 3-12	A footnote should be added to this figure to explain the apparently errant 2,3,7,8-TCDD data for the Saddle River. If the Saddle River is suspected to be a true source of this contaminant, this requires further investigation.
188	Figure 4-2	The figure depicts the LPR food web; however, birds and mammals are absent. Please provide reasoning for their exclusion or revise to include.
189	Figures 4-3 and 4-4	Revise Figures 4-3 and 4-4 to have consistent color schemes for benthic taxa.
190	Figure 4-8	The quality of this figure is poor and cannot be read. In addition, some of the river miles presented on the X axis are out of order.
191	Figure 5-1	The model output does not specify which salinity threshold was used. Please clarify the conditions used.
192	Figure 5-1	Delete "Daily Flood/Ebb Flux" from legend on middle panel (Dundee Dam). Make y-axis labels consistent for middle and bottom panels (tons versus MT)
193	Figure 5-4	The information presented in Figure 5-4 is based on data from fixed monitoring locations, so the data are not available to determine transport behavior at intermediate locations.

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194	Figure 5-6	Please revise to clarify what the estimate is based on.
195	Figure 5-9	The quality of this figure is poor and cannot be read.
196	Figure 5-13 a-f	Legend need to be clarified. If depth differences are being displayed, negative numbers would indicate deposition (more recent depth is shallower than earlier depth) Negative numbers on Fig. 5-13 indicate erosion
197	Figure 5-19	Standard Error bars should be added for the water column data. Legend need to identify if all tidal conditions are included and if surface and bottom data are included
198	Appendix B	Omit Appendix B as it doesn't provide supporting evidence for the CSM. The conclusions should have been written in such a way to those relating to the river. For instance, the EPA does not agree that contamination at RM10.9 comes from the salt wedge entirely.